

# Fire/EMS Response Task Force

## Preliminary Recommendations

A Task Force of the  
Acton  
Public Safety Facilities Building Committee  
(September 19, 2001)

**Project Goals**

1. Study and Recommend an appropriate projected level of Fire/EMS response protection for the Town of Acton for the next 20 years.
2. Develop and Cost a viable set of alternative Fire/EMS station location scenarios for consideration at a Town Meeting in early 2002.

**Task Force Members**

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Jan Patrick	<a href="mailto:Patrick@acunet.net">Patrick@acunet.net</a>	263-2635
Mal MacGregor (former Fire Chief)	None	263-9286
Bob Ingram	<a href="mailto:Ingram@FIAM.net">Ingram@FIAM.net</a>	263-2674
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# Acton's Changing Needs For Fire/EMS Response

(1979-1980 to 1999-2000)

Popu- lation	Med Age	2 Year's Incidents	Fire	Medical	Auto	Misc/ False	Total
	?	1979-1980	414	615	441	686	2156
		%	19%	29%	20%	32%	100%
20,331	37.9	1999-2000	139	1714	340	1272	3465
		%	4%	49%	10%	37%	100%

\*

\*

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## 2019-2020     Projections

Popu- lation	Med Age	2 Year's Incidents	Fire	Medical	Auto	Misc/ False	Total
24,500	40- 41	2019-2020	85-120	2340-2550	340-380	1275-1400	4000-4500
		%	2-3%	55-60%	8-9%	30-33%	95-105%

# Task Force Methodology

- Define Incidents
- Analyze 1999-2000 Incidents (3,465)
- Quantify present 3 Station 1<sup>st</sup> Response Time (Baseline)
- Develop milestones consistent with other Task Forces
- Correlate current response levels with FLAME results (FLAME is a nationally used software predictive tool)
- Identify alternative proposed station locations
- Utilize FLAME to investigate proposed alternatives
  - Establish comparative response times
  - Cost each alternative\* (Labor, Equipment, Structure construction/renovation, Land, etc.)
- Perform comparable town comparative analysis\*
- Develop recommendation(s) for review/approval by PSFBC-SC
- Present recommended course of action and associated cost at Town Meeting

\* with Financial Task Force support

# Acton

## Precinct-based Fire/EMS Incident Data (1999-2000)

<u>Precinct</u>	<u># Residents</u>	<u>% Population</u>	<u>Incidents per Precinct</u>	<u>% Incidents</u>	<u>Average Response</u>  (Min.)
<b>1</b>	3969	<b>19.9%</b>	884	<b>25.5%</b>	<b>5.0</b>
<b>2</b>	4117	<b>20.6%</b>	623	<b>18.0%</b>	<b>3.9</b>
<b>3</b>	3952	<b>19.8%</b>	379	<b>10.9%</b>	<b>3.4</b>
<b>4</b>	3694	<b>18.5%</b>	1052	<b>30.4%</b>	<b>3.2</b>
<b>5</b>	4231	<b>21.2%</b>	527	<b>15.2%</b>	<b>4.5</b>
	-----		-----		
<b>Total</b>	<b>19,963</b>	<b>100.0%</b>	<b>3,465</b>	<b>100.0%</b>	<b>4.0</b>

# Acton

## Fire/EMS Incident Data (1999-2000)

### (Highest Incident Locations)

<u>No.</u>	<u>Address</u>	<u>Function</u>	<u># Incidents</u>	<u>%</u>	<u>Precinct</u>
1	1 Great Road	Suburban Manor	177	5.1%	1
2	321 Main St.	Acton Medical	123	3.5%	4
3	68 Windsor Ave.	Senior Housing	65	1.9%	4
4	36 Charter Rd.	ABRHS	57	1.6%	4
5	16 Charter Rd.	R. J. Grey Junior High	35	1.0%	4
6	87 Hayward Rd.	Haartz	31	0.9%	4
7	117 Central St.	Dover Heights Apt.	30	0.9%	4
8	100 Powdermill Rd.	Powdermill Plaza	25	0.7%	5
			543	15.7%	
Next 33	All Precincts (# of Addresses)		463 (10-24)	13.4%	All (As Follows)
	15		189	5.5%	1
	5		69	2.0%	2
	3		33	1.0%	3
	7		123	3.5%	4
	3		49	1.4%	5
41			1,006	29.0%	

# Acton

## Fire/EMS Incident Data (1999-2000)

### (20 or Over Incidents by Street)

<b>No.</b>	<b><u>Street</u></b>	<b><u># Incidents</u></b>
1	Great Rd (Rt 2A)	604
2	Main (Rt 27)	433
3	Central	167
4	Mass Ave (Rt 111)	141
5	Charter	101
6	Windsor Ave	82
7	Nagog Park Drive	70
8	Arlington	68
9	Parker	58
10	School	58
11	Hayward Rd	54
12	Strawberry Hill Rd	50
13	High	47
14	Hosmer	47
15	Davis Rd	46
16	Powdermill RD (Rt 62)	41
17	Route 2	40
18	Pope Rd	33
19	Concord Rd	29
20	Knox Trail	27
21	Elm	26
22	Harris	26
23	Willow	26
24	Newtown Rd	25
25	Alcott	20
26	Nagog Hill Rd	20
		-----
<b>Total</b>		<b>2339</b>
<b>% Acton Total</b>		<b>68%</b>

# Acton

## Precinct-based Response Time in Min. (1999-2000)

### Cumulative % Precinct Response Times by Minute

Precinct	1	2	3	4	5	6	7	8	9	10	11
1	2%	8%	20%	43%	64%	81%	90%	96%	99%	99.5%	100%
2	6%	23%	46%	69%	83%	93%	97%	99%	99%	100.0%	100%
3	12%	35%	61%	77%	88%	95%	96%	98%	99%	100.0%	100%
4	9%	35%	65%	85%	94%	97%	98%	99%	99%	99.5%	100%
5	4%	10%	28%	53%	77%	88%	95%	98%	99%	99.6%	100%
Acton	6%	22%	44%	66%	81%	91%	95%	98%	99%	99.7%	100%



# Alternatives under Primary Consideration

## Assumptions

Maintain/improve Level of Service with cost sensitive solutions  
having sufficient growth potential  
Retain level staffing, if possible (excludes joint Dispatch)  
Retain 2-person first response

## Option 1

- Retain current 3 station locations
  - Renovate 3 buildings to code

## Option 2

- Relocate Central to North (27/2A) to potentially improve overall town response times
  - Build one new station (27/2A)
  - Renovate 2 stations
  - Reuse Central as is for other town needs; maintaining site for potential future Fire/EMS renovation/reuse if necessary

## Option 3

- Add 4<sup>th</sup> station at 27/2A
  - Improve town-wide response time
  - Build one new station (27/2A)
  - Renovate 3 stations
  - Will require additional staff and equipment

# **Alternatives NOT under Consideration**

## **(cont'd)**

### **Assumptions**

Improve Level of Service (response time) by meeting some or all new National Fire Protection Standards (NFPA) Standards

- 5 min. response 90% of the time (1-Turnout, 4 Travel)
- 4 Persons at First Response 90% of the time (Currently 2)

### **Alternative A**

- Meet 5 min./90% NFPA standard with 2 persons at First Response
  - How many stations are needed?
  - Where are the optimal locations?
  - What is the estimated cost?

### **Alternative B**

- Meet 5 min./90% NFPA standard with 4 persons at First Response
  - What is the estimated cost?

### **Alternative C**

- Meet 5 min./90% NFPA standard with 4 persons at First Response with level staffing and only 2 stations
  - Where are the optimal locations if there are 2 stations?
  - What would the average town-wide response time be?
  - What would the longest response time be?

**Proposed Alternative**  
**Locations for Acton Fire Stations**  
(using FLAME Statistics)

KEY:						ALTERNATIVES	
1999-2000 Recorded Results FLAME Estimates		TODAY	A	B	C	D	E
Stations/Locations		3 Stations	3 Sta - Relocate Central to North	4 Sta - Add North	2 Sta - Add North & Kellys Corner (Close 3 Exist Sta)	5 Sta - Add North @ Harris & 2A, East @ Concord & 2A (Keep 3 Exist Sta)	7 Sta - Add North & Kellys, North @ Harris & 2A, East @ Concord & 2A (Keep 3 Exist Sta)
1 - Central		1 - Central		1 - Central		1 - Central	1 - Central
2 - West		2 - West	2 - West	2 - West		2 - West	2 - West
3 - South		3 - South	3 - South	3 - South		3 - South	3 - South
Proposed NEW							
4 - North (27 & 2A)			4 - North	4 - North	4 - North		4 - North
5 - Kellys Corner (27 & 111)					5 - Kellys Corner		5 - Kellys Corner
6 - North/West (Harris & 2A)						6 - North/West	6 - North/West
7 - East (Concord Rd & 2A)						7 - East	7 - East
<b>A. 1999-2000 Results</b>							
<b>INCIDENT PERSPECTIVE (3,465 Incidents)</b>							
<b>A.1 Response (% Incidents)</b>							
Nearest Minute (0-6)		91%					
(6-9)		8%					
(9-10)		1%					
Nearest Minute (0-5)		81%					
(5-8)		17%					
(8-10)		2%					
<b>A.2 Response (Min.)</b>							
Townwide Average		4.0					
Range of Precinct Averages		3.2 - 5.0					
Incident Range		0 - 11					
<b>B. INCIDENT-BASED CALIBRATION with FLAME</b>							
<b>RECORDED 1999-2000 RESULTS vs. FLAME INCIDENT ESTIMATE (%)</b>							
<b>ACTUAL (3465 Incidents)</b>							
Minutes (0-6)		91%					
(6-10)		9%					
<b>FLAME ESTIMATE</b>							
Minutes (0-6)		89%	94%	96%			
(6-10)		11%	6%	4%			
<b>C. OTHER FLAME RESULTS</b>							
<b>C.1 RESPONSE TIME (Road Miles based)</b>							
<b>Station Coverage Responsibility (Mi.)</b>							

**Proposed Alternative**  
**Locations for Acton Fire Stations**  
(using FLAME Statistics)

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	TODAY	A	B	C	D	E
Stations/Locations	3 Stations	3 Sta - Relocate Central to North	4 Sta - Add North	2 Sta - Add North & Kellys Corner (Close 3 Exist Sta)	5 Sta - Add North @ Harris & 2A, East @ Concord & 2A (Keep 3 Exist Sta)	7 Sta - Add North & Kellys, North @ Harris & 2A, East @ Concord & 2A (Keep 3 Exist Sta)
1 - Central	1 - Central		1 - Central		1 - Central	1 - Central
2 - West	2 - West	2 - West	2 - West		2 - West	2 - West
3 - South	3 - South	3 - South	3 - South		3 - South	3 - South
<b>Proposed NEW</b>						
4 - North (27 & 2A)		4 - North	4 - North	4 - North		4 - North
5 - Kellys Corner (27 & 111)				5 - Kellys Corner		5 - Kellys Corner
6 - North/West (Harris & 2A)					6 - North/West	6 - North/West
7 - East (Concord Rd & 2A)					7 - East	7 - East
1	63		38		27	21
2	34	42	34		33	30
3	33	41	34		34	27
4		48	26	39		13
5				92		16
6					19	8
7					19	16
<b>Average Response (Min.)</b>						
1	5.3		3.7		3.4	3.4
2	4.3	4.4	4.3		4.3	4.4
3	3.6	4.0	3.6		3.6	3.5
4		5.2	4.5	4.8		3.9
5				5.3		3.2
6					3.7	2.6
7					3.9	3.7
Townwide Average	4.4	4.5	4.1	5.1	3.8	3.5
<b>1st-in Company (Mi.) (% of Road Miles)</b>						
Minutes (0-6)	81%	81%	92%	70%	95%	95%
(6-9)	18%	19%	8%	30%	5%	5%
(9-10)	1%	0%	0%	0%	0%	0%
<b>Response Area Overlap (Mi.)</b>						
Miles in 10 Min. (No Overlap)	23	24	2	48	1	0
(2 Overlap)	11	41	27	83	6	1

**Proposed Alternative**  
**Locations for Acton Fire Stations**  
 (using FLAME Statistics)

□

KEY: 1999-2000 Recorded Results FLAME Estimates	ALTERNATIVES					
	TODAY	A	B	C	D	E
	3 Stations	3 Sta - Relocate Central to North	4 Sta - Add North	2 Sta - Add North & Kellys Corner (Close 3 Exist Sta)	5 Sta - Add North @ Harris & 2A, East @ Concord & 2A (Keep 3 Exist Sta)	7 Sta - Add North & Kellys, North @ Harris & 2A, East @ Concord & 2A (Keep 3 Exist Sta)
Stations/Locations						
1 - Central	1 - Central		1 - Central		1 - Central	1 - Central
2 - West	2 - West	2 - West	2 - West		2 - West	2 - West
3 - South	3 - South	3 - South	3 - South		3 - South	3 - South
<b>Proposed NEW</b>						
4 - North (27 & 2A)		4 - North	4 - North	4 - North		4 - North
5 - Kellys Corner (27 & 111)				5 - Kellys Corner		5 - Kellys Corner
6 - North/West (Harris & 2A)					6 - North/West	6 - North/West
7 - East (Concord Rd & 2A)					7 - East	7 - East
(3 Overlap)	97	67	103	-	124	130
<b>Miles in 10 Min. (No Overlap)</b>	17%	18%	2%	37%	1%	0%
(2 Overlap)	8%	31%	21%	63%	5%	1%
(3 Overlap)	74%	51%	78%	0%	94%	99%
<b>C.2 POPULATION PERSPECTIVE (% 2000 Town Census)</b>						
<b>1st-In Company</b>						
Minutes (0-6)	86%	85%	96%	72%		
(6-10)	14%	15%	4%	28%		

# Status

<u>Task</u>	<u>Status</u>
• Analysis of 1999-2000 data	complete
• Response time baseline established	complete
• Detail milestones	complete
• Correlation of FLAME with current response levels	complete
• Alternatives identified	complete
• Fire Department learning FLAME functionality and assessing alternatives	complete
• Fire Department collection of labor and equipment cost data	complete
• Consultant to supply construction/renovation cost estimates	not finalized
• Town staff to provide land cost estimates for selected alternatives	not finalized
• Present recommendations using <u>preliminary</u> cost estimates	9/19/01

## Acton Fire Response Options - Addressing Today's and 2020 Needs

	<u>Option 1</u>	<u>Option 2</u>	<u>Option 3</u>
<b>Issues</b>	<b>Modernize Existing Stations</b>	<b>-Modernize West &amp; South Stations , New Station at 27/2A, &amp; Close Central Station</b>	<b>Modernize all stations &amp; new station at 27/2A</b>
<b><u>Response Time</u></b>			
2001 response time with 20,000 population	91% coverage in 6 minutes or less. Response times fall below 90% by 2004 due to population growth	94% coverage in 6 minutes or less	96% coverage in 6 minutes or less
2020 response time with 24,500 population	75-80 % coverage in 6 minutes or less	90-94 % coverage in 6 minutes or less	95-96 % coverage in 6 minutes or less

## Acton Fire Response Options - Addressing Today's and 2020 Needs

	<u>Option 1</u>	<u>Option 2</u>	<u>Option 3</u>
Issues	Modernize Existing Stations	-Modernize West & South Stations , New Station at 27/2A, & Close Central Station	Modernize all stations & new station at 27/2A
<u>Ladder Truck response time</u> - need is in the 27/2A area	Poor location in South Acton. Response time to 27/2A greater than 6 minutes	Excellent location in North Acton.	Excellent location in North Acton.
<u>Staffing Requirements</u>			
Personnel	No Change	No Change	Additional staffing of 10 persons
Training	None Required	None Required	10 person years of expense



## Acton Fire Response Options - Addressing Today's and 2020 Needs

	<u>Option 1</u>	<u>Option 2</u>	<u>Option 3</u>
<b>Issues</b>	<b>Modernize Existing Stations</b>	<b>-Modernize West &amp; South Stations , New Station at 27/2A, &amp; Close Central Station</b>	<b>Modernize all stations &amp; new station at 27/2A</b>
<u><b>Apparatus</b></u>	No Change	No Change	1 additional piece of apparatus

## Acton Fire Response Options - Addressing Today's and 2020 Needs

	<u>Option 1</u>	<u>Option 2</u>	<u>Option 3</u>
<u>Issues</u> <u>Life Cycle</u> <u>Costs</u>	Modernize Existing Stations	-Modernize West & South Stations , New Station at 27/2A, & Close Central Station	Modernize all stations & new station at 27/2A
Station Upgrade cost @ \$500K/Sta., 5%, 20 yrs.	\$2,287,500	\$1,525,000	\$2,287,500
New station cost @ \$2.0M, 5%, 20 yrs.	\$0	\$3,050,000	\$3,050,000
Additional Apparatus @ \$250K each	\$0	\$0	\$250,000

## Acton Fire Response Options - Addressing Today's and 2020 Needs

	<u>Option 1</u>	<u>Option 2</u>	<u>Option 3</u>
		-Modernize West & South Stations , New Station at 27/2A, & Close Central Station	Modernize all stations & new station at 27/2A
<b>Issues</b>	<b>Modernize Existing Stations</b>		
<b><u>Additional Staffing Costs</u></b>			
Yearly Salary @ \$55,000 per person year over 20 years (excl. inflation)	\$0	\$0	\$11,000,000
Training Costs - one time - 10 person years	\$0	\$0	\$550,000
	*****	*****	*****
<b>Total Option Cost</b>	<b>\$2,287,500</b>	<b>\$4,575,000</b>	<b>\$17,137,500</b>

# **Fire/EMS Task Force Recommendation**

## **Option 2**

### **The Best Long Term Strategic Direction to**

- ◆ **Deliver More Equitable Town-Wide Service**
- ◆ **Likely Eliminate the Future Need for a 4<sup>th</sup> Station**
- ◆ **Best Deploy the Ladder Truck where Most Needed – Now and in the Future**
- ◆ **Better Meet Future New Growth in N. Acton**
- ◆ **Slightly Improve Current Level of Service Regardless of Growth**
- ◆ **Permit Implementation in Phases as Budgets Permit**